



Source: John Largier, Bodega Marine Lab, University of California, Davis
Base map provided by The Ocean Conservancy

Schematic of Major Oceanographic Features off the North Central Coast *Marine Life Protection Act*

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Blue zones indicate upwelling centers which are localized at capes (Pt Arena, Pigeon Pt) or expand along much of the coast, while blue arrows indicate plumes of upwelled waters moving south and offshore from upwelling centers. Green arrows indicate plumes of San Francisco Bay outflow, moving either south (during upwelling) or north (during weak winds or winter). Strong winter outflow from rivers like the Russian and Gualala is demarcated by brown arrows. Not shown is the retention zone in Drakes Bay and smaller zones in Bodega Bay and Half Moon Bay. These schematic patterns change with the wind, land runoff, seasons and years.